

Plug-in Electric Vehicle Charging Infrastructure Case Studies

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Who is CFCI?

- Started in 1999 by 2 former Edison employees
- EVSE and CNG Infrastructure company
- The Past
 - Installed much of legacy infrastructure in 1996-2003 time period
 - Early GM, Toyota, Nissan, Ford, BMW and Honda EV programs
- Current customers include:
 - Disney
 - NRG
 - AQMD
 - Kaiser Permanente
 - BMW (MINIE)
- C-10 Electrical contractor's license
- Woman-owned business
- Fleet of EV and CNG vehicles





CFCI Products and Services









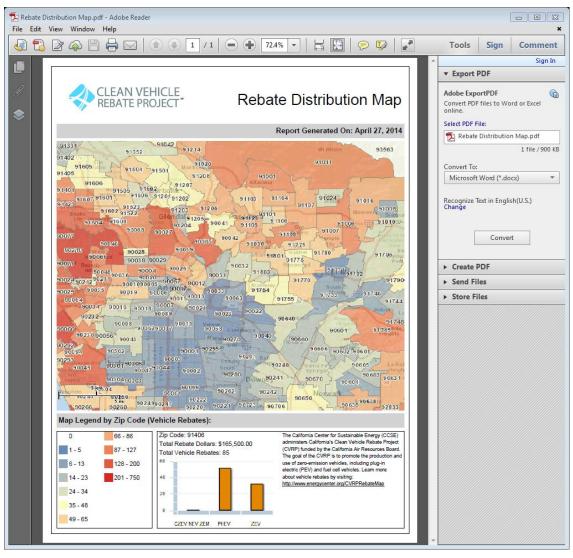








Where Are Cars Being Sold?

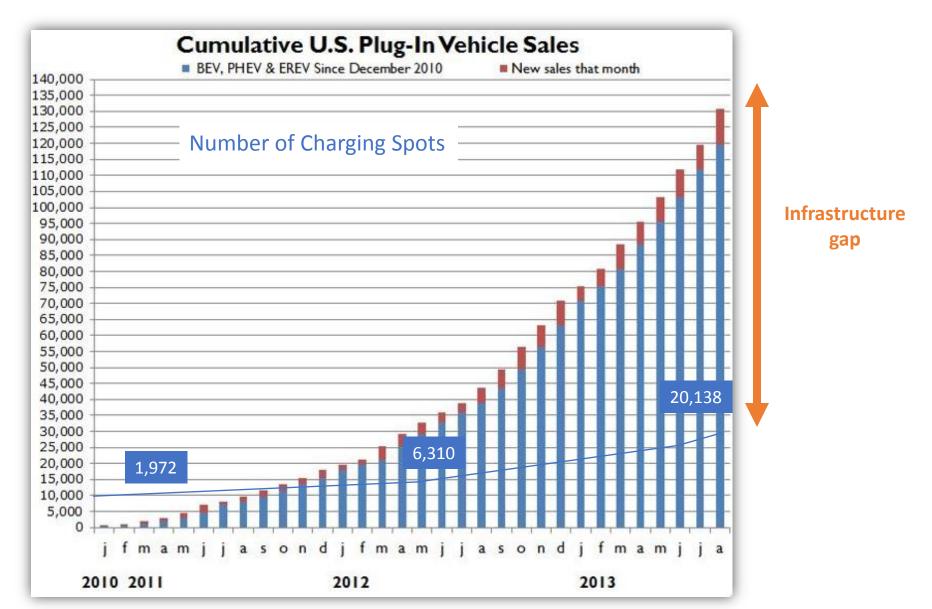


- Public charging is still single largest source of dissatisfaction with plug-in vehicles
- Xx percent of drivers have access to charging at work

Source: California Center for Sustainable Energy



harging Infrastructure Lags EV Growth





Case Studies

- Kaiser Permanente
- Disney
- Redwood City
- Friendly Franchises (Carl's Jr.)





- Mission--Provide workplace, member and guest charging
- Partners—NRG/eVgo, CFCI
- Funding—NRG financing, internal, CEC grant
- Form of Agreement—third party contract to provide service to Kaiser facilities through individual Work Authorizations
- Positives—many employee requests for charging, cooperative and enthusiastic customer
- Challenges—large, complex organization, layers of bureaucracy, no budget



KP Status

- Kaiser Permanente has signed contracts with two vendors, NRG eVgo and Clean Fuel Connection, to bring Electric Vehicle charging to Kaiser Permanente facilities nationwide
 - 3 year contracts starting December 2013
- The vendors are currently working with ~30 pilot sites to develop approach and process needed for wider rollout
- Options will be presented to each site in a customized Master Site Plan following a site walk and information gathering
- Recently won CEC grant for workplace charging for Kaiser





Vendor Services Offered

- Pre-Installation Phase
 - Master site planning
 - Technical consultation
 - Apply for and coordinate grants and incentives on behalf of Kaiser Permanente



- Installation and Post-Installation Phases
 - Provide chargers and network equipment
 - Turnkey installation
 - Manage user access and collect charger fees on behalf of Kaiser
 - Perform all repair and maintenance
 - Electricity reimbursement







Sample Master Plan



SITE LAYOUT AND LOCATION OPTIONS FOR EV CHARGING



DC Fast Charger location

Level 2 Chargers location(s) -options for 2nd floor and roof

Page | 1

EV Charging Master Plan - Woodland Hills Medical Center

HARDWARE AND NETWORK COST

Level 2 Chargers

Option A: Ready-for-EV Dedicated Charging Solution

- \$29.95/month + \$0.50-\$1.00/hour charge time to employees
- Variable pricing applied 100% to Kaiser Permanente electricity costs
- One vehicle per charger

Option B: Shared Charging Solution

- \$29.95/month cost to Kaiser Permanente (\$15/month hardware + \$14.95
- Drivers may access chargers using eVgo subscription, or walk-up via credit
- · Usage charges applied 100% to Kaiser Permanente electricity costs and monthly costs until zero, then 100% to eVgo.
- Multiple vehicles per charger

AVAILABLE OUTSIDE FUNDING

NRG Energy / Calfornia Public Utilities Commission Settlement Funding This site falls within the service territory of Los Angeles Department of Water and Power and is therefore NOT eligible for NRG / CPUC settlement funding.

LADWP Electric Vehicle Charger Rebate Program

This site IS eligible for LADWP rebates of \$750 per wall-mount Level 2 charger. In order to qualify, the site must have at least 250 employees. One rebate is available for every 250 parking spaces available to employees at the premises. The employer must also allow employees to access the chargers without a fee or payment for a period of 90 days immediately following installation.

SoCalEV Ready Program / AB118

This site IS eligible for the SoCalEV Ready Program. Participants must demonstrate eligibility for the LADWP Electric Vehicle Charger Rebate Program (see above), and chargers must be installed by May 31, 2014. The rebate provides \$2,500 per eligible Level 2 charging station.

Page | 3

This site IS eligible for the Green Charging Networks grant program, which provides funding for (1) DC Fast Charger and up to \$30,000 for installation. Investigations regarding this program are ongoing.

EV Charging Master Plan - Woodland Hills Medical Center INSTALLATION SCOPES AND COST

- Assemble and mount 1DC fast charger
- Pour pad for DC fast charger
- Trench 145' from pull box to DC charger (host to install conduit from
- electrical panel to pull box) Run 150' 2" P.V.C
- Back fill trench
- Pull wire from panel to DC fast charger Install new 125 amp circuit breaker



Level 2 Chargers

Option A: Level 2 of parking structure, directly adjacent to electrical room

- Assemble 5 dual E.V.S.E systems Wall mount 5 dual E.V.S.E system
- Install new 75KVA transformer
- Install new 120/208v panel
- Run 30' of 1 1/4 " E.M.T surface mount Run 90' 1" E.M.T surface mount
- Run 90' 44" E.M.T surface mount
- Pull wire from panel to E.V.S.E
- Install 75 KVA Dry transformer

Installation cost: \$30,446

Option B: Roof of parking structure, directly above electrical room

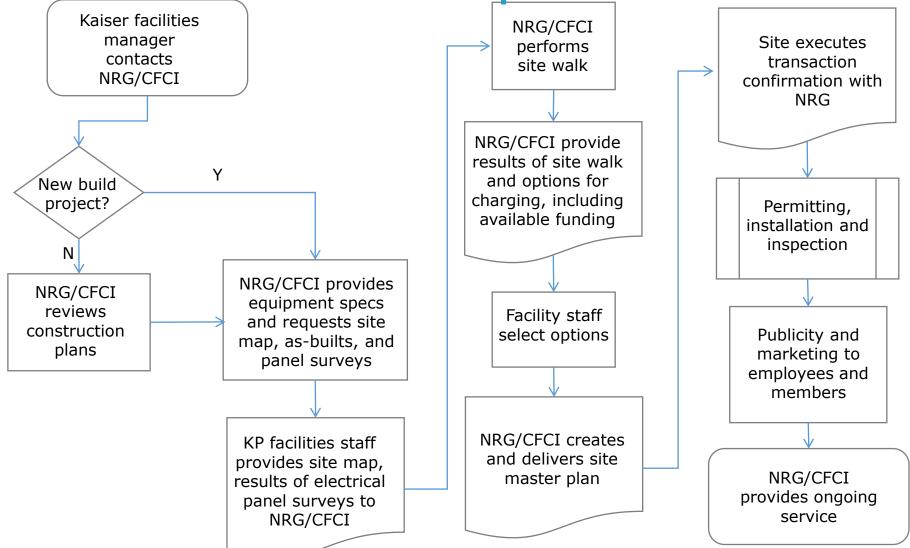
- Assemble S dual E.V.S.E systems Wall mount 5 dual E.V.S.E system
- Install new 75KVA transformer
- Install new 120/208v panel
- Run 70' of 1 1/4 " E.M.T surface mount
- Run 90' 1" E.M.T surface mount
- Run 90' %" E.M.T surface mount Pull wire from panel to E.V.S.E
- Install 75 KVA Dry transformer
- Test E.V.S.E systems
- Installation cost: \$36,446

EV Charging Master Plan - Woodland Hills Medical Center South Coast Air Quality Management District Funding This site 15 eligible for the SCAQMD funding which provides (1) dual-output DC Fast Charger and up to \$25,000 towards installation. EV ADOPTION WITHIN SERVICE TERRITORY (HISTORICAL) Usey C Ar Dent C Courty ® Zo Co CZEV NEV ZEU PHEV Source: California Center for Sustainable Energy

10



Site Implementation Steps





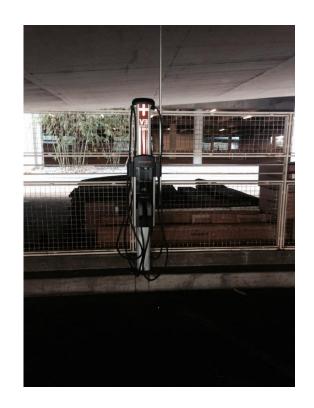
Disney

- Mission--Provide workplace and guest charging
- Partners—ChargePoint, CFCI
- Funding—Internal, new CEC grant
- Form of Agreement—Chargers purchased directly from ChargePoint or CFCI; new installations added to existing contract with CFCI
- Positives—chargers are receiving substantial utilization, high profile and enthusiastic customer, data driven
- Challenges—large, complex organization, budget constraints



Disney—Status

- Installed ChargePoint workplace units at 5 sites
- Installed ChargePoint public charging at Mickey And Friends
- Under CalStart leadership won CEC grant for Additional public charging at multiple Disney hotels and downtown Disney



Charging station at Mickey and Friends

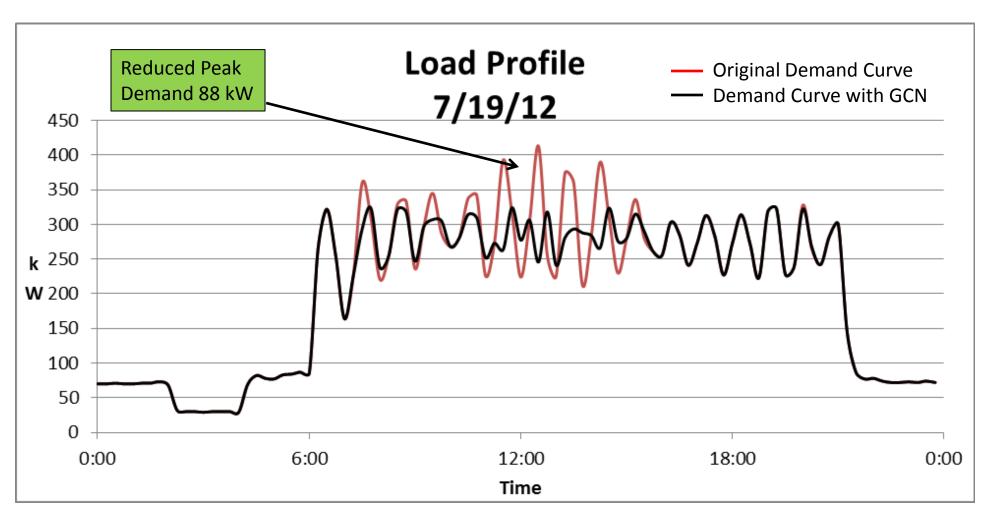




- Mission--Provide public DC fast charging with 30kW/30kWh energy storage system to reduce peak demand charges
- Partners—Green Charge Networks, NRG/eVgo, CFCI, ChargePoint, Nissan
- Funding—CEC grant, SGIP, peak energy savings
- Form of Agreement—GCN contract with NRG; CFCI installation contract with NRG
- Positives—solves peak demand issue for DCFC; energy storage shaves facility demand when charger not being used
- Challenges—meeting Nissan program deadlines, utility interconnection agreements, installation costs



SCE Retail Location





GCN System

Green Stat storage and Green Syncalgorithms,

Green Station – Intelligent energy storage and enterprise data analytics

Green Synergy Client – Advanced data algorithms, reporting and savings analysis









Project sites:

Shore Hotel Santa Monica 49ers Stadium Peralta College (3 sites) City of Lancaster Redwood City (2 sites) Kaiser Permanente San Rafael 7-11 (4 sites)

Complex Structure

Project Work Breakdown by Contractor/Subcontractor													
	Prime Contractor	Subcontractor	GreenStation™	DC Fast Charger	Contracting	Permitting	Engineering & Installation	Network Service Provider					
GCN	X		X		Х	X							
CFCI		X					X						
ChargePoint		Х						Х					
Nissan				Х									



Friendly Franchises (Carl's Jr.)

- Mission—Meet City of LA Condition of Approval
- Partners—ChargePoint, CFCI
- Funding—Internal
- Form of Agreement—CFCI sold and installed ChargePoint units
- Positives--High profile customer, ROI driven
- Challenges—Personnel turnover, compliance driven





Friendly Franchises: ROI Calculator

	Costs	4 cars per day			Costs	2 cars per day	2 cars per day	
Δ	Electricity Cost per kwh	\$	0.13	^	Flacksisis. Cook you love	ć	0.12	
В	kilowatts used per hour	, , ,	7.2	В	Electricity Cost per kwh kilowatts used per hour	\$	0.13 7.2	
				D	Kilowatts used per flour		7.2	
С	Average stay per vehicle (hours)		0.5	С	Average stay per vehicle (hours)		0.5	
D	Average usage per vehicle (kwh)		3.6	D	Average usage per vehicle (kwh)		3.6	
F	Noveles of season beauties and dec							
Ł	Number of cars charging per day		4	E	Number of cars charging per day		2	
D	Cost per charger per day	\$	1.87	D	Cost per charger per day	\$	0.94	
F	Days per year charger is used		300	F	Days per year charger is used	·	300	
	(1,40,40,45)							
	Cost per year (A*B*C*E)	\$	561.60		Cost per year (A*B*C*E)	\$	280.80	
	Revenue				Revenue			
					revenue			
Α	Per charge cost	\$	2.00	Α	Per charge cost	\$	2.00	
В	Days Used		300	В	Days Used		300	
С	Charges per day		4	С	Charges per day		2	
D	Revenue per year	\$	2,400.00		D	A	4 200 00	
<u> </u>	neveriue per yeur	Ÿ	2,400.00	D	Revenue per year	\$	1,200.00	
E	Electricity cost per year	\$	561.60	E	Electricity cost per year	\$	280.80	
	Profit per year	\$	1 020 40			4	040.55	
	Profit per year	Ş	1,838.40		Profit per year	\$	919.20	



In conclusion....

- Many motivations, many models
- Good news: demand from drivers!
- Challenges: internal bureaucracy, funding, ROI

THANK YOU!

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